Coatings for Fuel Cell Propulsion Compressor Bearings, Phase I

Completed Technology Project (2005 - 2006)

Project Introduction

Fuel cell air handling systems require clean and contaminant-free inlet air, which dictates that oil-free, motorized, compressor/expander systems should be used. Although there is no sliding contact in the steady state operation of the foil bearing, occasional contact between the foil and journal surfaces at startup and shutdown and during overload situations, could limit the bearing life. Therefore, to ensure that the compressor system is highly efficient and reliable the foil air bearings need wear resistant, low friction coatings. The objective of the proposed STTR investigation is to identify new coatings for use in fuel cell propulsion compressor bearings that would allow the foil bearing to be functional from low temperature start-up conditions to the maximum temperatures encountered during operation. The proposed program will build on a novel hydrogenated diamond like carbon (DLC) coating developed at the Argonne National Laboratory (ANL). The goal of this joint MiTi

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and ANL STTR Phase I program is to demonstrate the feasibility of ANL hydrogenated DLC and MiTi

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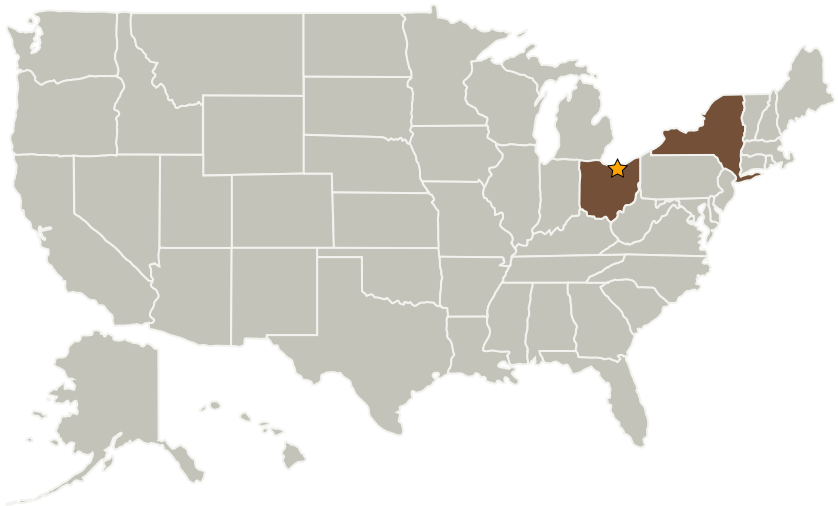
KorolonTM coating technology for fuel cell propulsion compressor bearings. This will be accomplished through coating adhesion and tribological testing of the coatings against various potential shaft coatings such as the NASA developed PS304 and/or Korolon 1350B.

Primary U.S. Work Locations and Key Partners



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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Glenn Research Center (GRC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

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Organizations Performing Work	Role	Type	Location
★Glenn Research Center(GRC)	Lead Organization	NASA Center	Cleveland, Ohio
Mohawk Innovative Technology, Inc.	Supporting Organization	Industry	Albany, New York

Primary U.S. Work Locations	
New York	Ohio

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Technology Areas

Primary:

- TX03 Aerospace Power and Energy Storage
  - TX03.2 Energy Storage
    - TX03.2.2 Electrochemical: Fuel Cells